

SORBUS AND THE PROBLEM OF GENERIC TYPIFICATION

† GEORGE K. BRIZICKY

HAVING BY CHANCE opened volume two of the Ray Society's facsimile (1959) of Linnaeus's *Species Plantarum* at page xi of W. T. Stearn's excellent preface I read: "The printing of an index to the *Species Plantarum* has thus provided a convenient opportunity for summarizing opinions on the typification of most Linnaean genera. The need for this is emphasized by Article 22 of the *International Code of Botanical Nomenclature 1956* which rules that 'the subgenus or section including the type species of the correct name of the genus to which it is assigned repeats that name unaltered as its epithet' . . . Its effect may be exemplified by the nomenclature of the sections of the genus *Sorbus*. Thus, if *Sorbus domestica* L. is accepted as the lectotype of *Sorbus*, as, following Hitchcock and Green, it should be, then section *Cormus* (Spach) C. K. Schneider to which it belongs must be renamed section *Sorbus* and section *Sorbus* Pers. (1806) becomes section *Sorbaria* Schauer. In genera, such as *Sorbus*, for which more than one lectotype has been proposed, it is undesirable to disturb established nomenclature until general agreement has been reached on a suitable lectotype."

Although I value most highly Stearn's "summarizing opinions on the typification of most Linnaean genera," I can not agree with his concluding sentence in the quotation above for a number of reasons: 1) following Stearn's suggestion not to disturb established nomenclature until general agreement has been reached on a suitable lectotype in genera for which more than one lectotype has been proposed means to admit and tolerate two or three different type species and, eventually, two or three different typical subgenera and/or sections in about 113 Linnaean genera; 2) of two or three lectotypes proposed for a generic name only one is correct, i.e., chosen in conformity with the *International Code of Botanical Nomenclature*; 3) when a correctly chosen lectotype is found, this choice must be followed, and no general agreement is necessary for its adoption; and 4) with regard to the importance of typification of genera, verifying the lectotype choices and/or typifications of the genera should be encouraged, not discouraged. For convenience in illustrating these points I shall use the same example as that given by Stearn, i.e., the typification of *Sorbus* L.

In his *Species Plantarum* (1: 477. 1753), Linnaeus established the genus *Sorbus* with two species, *S. aucuparia* and *S. domestica*. In 1908, Britton (N. Am. Trees 427) designated *Sorbus domestica* L. as type of the generic

† Dr. Brizicky had completed the manuscript for this paper some time before his death on June 15, 1968.

name. This choice of lectotype, made without explanation, was adopted by Britton and Brown in 1913 (Illus. Fl. No. U.S. 2: 287). In 1929, Hitchcock & Green (Int. Bot. Congr. Cambridge 1930. Nomencl. Propos. Brit. Bot. p. 158) independently proposed *S. domestica* L. as the lectotype species of *Sorbus* L., with the following argumentation: "The choice of standard-species lies between *S. Aucuparia* and *S. domestica*. *Sorbus* was restricted to *S. domestica* in 1789 by Medicus, Phil. Bot. 138, who treated *S. Aucuparia* as the type of an independent genus *Aucuparia* Rivin. The type of Tournefort's *Sorbus* was evidently *S. domestica* judging from the vernacular name "Sorbier" and from citations given by him. Therefore, *S. domestica* is chosen as the standard-species."

Britton's choice of *S. domestica* as the lectotype of *Sorbus*, supported by Hitchcock & Green's argumentation, has generally been adopted, except by Rehder, who designated *S. aucuparia* L. as the lectotype species of *Sorbus*, but without explanation of this choice (Bibliogr. Cult. Trees Shrubs 252. 1949). The general adoption of Britton's choice of *S. domestica* does not necessarily mean that his selection of lectotype was correct from the standpoint of the International Code, and, since it was challenged by that of Rehder, the typification of *Sorbus* must be reviewed.

The genus *Sorbus* of Linnaeus, originally founded by him in 1737 (Gen. Pl. 144), was described from a living plant as having flowers with three styles and twenty stamens inserted on the calyx. In the same year Linnaeus (Hort. Cliffort. 188) also established the single species "*Sorbus foliis pinnatis*" (with the synonyms: "*Sorbus sylvestris*. Dalech. hist. 332. *Sorbus sylvestris alpina*. Lob. hist. 544. *Sorbus sylvestris, foliis domesticae similis*. Bauh. pin. 415. *Sorbus aucuparia*. Bauh. hist. 1. p. 62. Boerh. lugdb. 2. p. 248. *Aucuparia rivini*. Rupp. jen. 112."). There was appended [var.] *a*. "*Sorbus sativa*. Bauh. pin. 415." (with the synonyms: "*Sorbus domestica*. Lob. hist. 544. *Sorbus legitima*. Clus. hist. 1. p. 10. *Sorbus*. Bauh. hist. 1. p. 59. Dalech. hist. 330. Dod. pempt. 803."). Although a detailed description of the species was lacking, the references to the synonyms characterized the species proper and its variety *a* quite well. In addition, the ranges were given separately for the species proper and the [var.] *a*: "*Crescit in* Lapponia, Norvegia, Finlandia, Suecia, Dania, Germania, Helvetia, Anglia, Gallia & *locis umbrosis & spongiosis*, at (*a*) *in* Italia, Germania, Helvetia." In *Species Plantarum* (1: 477. 1753) the "*Sorbus foliis pinnatis*" of *Hortus Cliffortianus* received the name *Sorbus aucuparia*, and its [var.] *a* was raised to the rank of species with the name *Sorbus domestica*.

The occurrence of three styles ("Styli tres . . ."), i.e., of three carpels, in *Sorbus* was considered by Linnaeus to be a generic character, on the basis of which *Sorbus* was placed by him in the special order *Trigynia* of the Class *Icosandria* (Gen. Pl. ed. 5. p. xxiii). In 1777, in his *Illustratio systematis sexualis Linnaei*, John [John] Miller gave a rather detailed description of *Sorbus* (based on *S. aucuparia*) as the representative of *Icosandria-Trigynia*, and this was accompanied by an excellent detailed

drawing of *S. aucuparia*. The pistil was described and illustrated as having three styles and the cross section of fruit showed three locules.

In 1793, Medicus (Geschichte der Botanik, 86, 87) divided *Sorbus* L. into two distinct genera, *Aucuparia*, a new genus, based on *S. aucuparia* L. (*Aucuparia silvestris* Medic.) and *Sorbus*, based on *S. domestica* L. The two genera differed in the following characters: *Aucuparia*, "Zahl der Griffel drei bis fünf . . . Drei bis fünf Pericarprien . . . In jedem Gefache zwei Saamen"; *Sorbus*, "Fünf Griffel, selten weniger. Innerhalb dem Fleische sitzt ein fünffächerichtes Pericarpium . . . In jedem Gefache ein Saame."

In 1834, Spach (Hist. Nat. Vég. 2: 91–98) also divided the original *Sorbus* L. into two genera: *Sorbus* L., including *S. aucuparia*, *S. hybrida* L., *S. lanuginosa* Kit., *S. foliosa* Wall., and *S. americana* Pursh; and *Cormus* Spach, a new genus, based on *Sorbus domestica* L. The distinguishing characters were: *Sorbus*, "Ovaire adhérent, à 3 (quelquefois à 2 ou 4) loges biovulées. Styles en même nombre que les loges de l'ovaire . . . Pyridion globuleux ou subturbiné, ombiliqué aux deux bouts, à 2–4 loges 1-spermes; endocarpe mince, crustacé"; *Cormus*, "Ovaire adhérent, à 5 loges biovulées. Styles 5, filiformes . . . Pyridion pyriforme ou subglobuleux, subquinquélouculaire; endocarpe membraneux."

Neither Medicus's nor Spach's segregation has generally been adopted, and *Sorbus*, including both original species, has usually been treated either as a subgenus of *Pyrus* L. or as a distinct genus (subdivided into two to four subgenera and/or sections). Although some authors have placed both of the original Linnaean species in the same subgenus (e.g., Persoon, Synop. Pl. 2: 38. 1806; Koch, Hort. Dendrol. 177. 1853) or in the same section (e.g., Dumortier, Florula Belg. 93. 1827; Neilreich, Fl. Nieder-Oesterr. 886. 1858), others have separated the two and placed each of them in a different subgenus (e.g., Duchartre in D'Orbigny, Dict. Univ. Hist. Nat. 11: 685. 1848) or in a different section (e.g., Boissier, Fl. Orient. 2: 657. 1872). Only Decaisne (Nouv. Arch. Mus. Hist. Nat. Paris 10: 156, 157. 1874) and Koehne (Gartenflora 40: 35, 39. 1891 and Deutsch. Dendrol. 246, 254. 1893) followed Spach in recognizing *Sorbus* L. and *Cormus* Spach as distinct genera (which Koehne even placed in different subdivisions of the family, Sorboideae and Maloideae, respectively).

After this brief review of the establishment of the genus and some facts important for its typification, it is pertinent to return to Hitchcock and Green's argument in support of the choice of *Sorbus domestica* as the lectotype species of the genus. Their main points were these: 1) "*Sorbus* was restricted to *S. domestica* in 1789 by Medicus, Phil. Bot. 138, who treated *S. Aucuparia* as the type of an independent genus *Aucuparia* Rivin." and 2) "The type of Tournefort's *Sorbus* was evidently *S. domestica*." The second point may be dismissed here as irrelevant, because one must consider the typification of *Sorbus* of Linnaeus, 1753, and not of that of Tournefort. The first point, however, deserves a detailed discussion.

"One of the first things to do in selecting a type is to exclude from con-

sideration those species that definitely disagree with the generic description," wrote Hitchcock (Am. Jour. Bot. 10: 511. 1923) a few years before his and Green's proposal of *S. domestica* as the standard-species of *Sorbus*. Later, in the preface to their "Standard-species of Linnaean genera of Phanerogamae (1753-54)" (Int. Bot. Congr. Cambridge 1930. Nomencl. Propos. Brit. Bot. 112. 1929) Hitchcock and Green mentioned this and another criterion for the typification of genera accepted in the Type-basis Code, "[Art.] (6c) species which definitely disagree with the generic description (provided others agree) are to be excluded from consideration; (7a 1) the type-species is often indicated by closer agreement with the generic description." Regrettably, these very sound criteria were not utilized by Hitchcock and Green in their choice of the lectotype species of *Sorbus*, for they unquestioningly accepted Medicus's segregation of *Aucuparia* as "typification by elimination." The most recent *International Code of Botanical Nomenclature* (1966) is, however, very explicit in regard to the typification of taxa, providing a "Guide for determination of types" (pp. 71, 72), and *Sorbus* must be typified as outlined below.

There can be hardly a doubt that *Sorbus* L., of 1737 (Gen. Pl. 144), was based on and its generic description drawn from the "*Sorbus foliis pinnatis*" proper (Hort. Cliffort. 188) and not from its variety *a*. Since the generic description of *Sorbus* in the fifth edition of Linnaeus's *Genera Plantarum* (1754, p. 213) was identical with that of the first, we may assume that the typical species must have remained the same, i.e., "*Sorbus foliis pinnatis*" of *Hortus Cliffortianus*, 1737 = *Sorbus aucuparia* L. of *Species Plantarum*, 1753.

Moreover, after describing *Sorbus* as having three styles, Linnaeus placed it in the order *Trigynia* of *Icosandria*. Miller (Illus. Syst. Sexual. Linnaei 1777) exemplified this order by *Sorbus aucuparia*, the pistil of which was described and illustrated as having three styles. Medicus (Gesch. Bot. 1793; see above) mentioned three to five styles and three to five pericarpia in *S. aucuparia*, and five, rarely fewer, styles and a five-locular pericarpium in *S. domestica*. His observations, except the occurrence of five styles and five pericarpia in *S. aucuparia*, have been confirmed by numerous taxonomists. Thus, Spach (Hist. Nat. Vég. 2: 91-98. 1834) mentioned the three-, sometimes two- or four-locular ovary in *Sorbus*, as represented by *S. aucuparia*, and the five-locular ovary in *Cormus*, based on *S. domestica*. Düll (Die *Sorbus*-Arten und ihre Bastarde in Bayern und Thüringen. Ber. Bayer. Bot. Ges. 34: 11-65. 1961) speaks of "mostly 5 carpels and styles" in *S. domestica* and of "ovary with 3, rarely 4 carpels" in *S. aucuparia* [translation supplied]. Kovanda (Flower and fruit morphology of *Sorbus* in correlation to the taxonomy of the genus. Preslia 33: 1-16. 1961) reports, "Most often 3 carpels, rarely 4, in singular cases 2" in *S. aucuparia*, while in *S. domestica* "There are always 5 carpels. Their number is absolutely constant and is not subject to any fluctuations."

These old and recent data regarding the gynoecium in the two original species of *Sorbus* clearly demonstrate that *S. aucuparia* definitely agrees

and *S. domestica* disagrees with the generic description of *Sorbus* L. (1754) in the characters of the gynoecium. Consequently, *S. domestica* can not be the type of *Sorbus*, and Medicus's *Aucuparia*, based on the same type as *Sorbus* L. (i.e., on *S. aucuparia*), is illegitimate and must be reduced to synonymy with the latter. *Sorbus* Medic. then becomes a later homonym of *Sorbus* L. In fact, Miller (1777) had already indicated the typification of this genus by *S. aucuparia*. Spach (1834), too, correctly based *Sorbus* on *S. aucuparia* in segregating *S. domestica* as a distinct genus, *Cormus*. Also Duchartre (in D'Orbigny, Dict. Univ. Hist. Nat. 11: 685. 1848), Beck von Mannagetta (in Reichenbach, Ic. Fl. Germ. Helvet. 25(1): 35, 36. 1910?), and Boissier (Fl. Orient. 2: 657. 1872) correctly based the typical subdivision of *Sorbus* on *S. aucuparia* with "ovarium triloculare (raro 2-4-loculare)" (Boissier), while *S. domestica* was placed in the subgenus (Duchartre, Beck) or section (Boissier) *Cormus* with "ovarium quinqueloculare, styli 5" (Boissier). Bentham & Hooker (Gen. Pl. 1: 626. 1865) regarded three styles as a distinctive character of *Sorbus*, and Beck von Mannagetta (Fl. Nieder-Österr. 708, footnote. 1892) stated that "Linnés Gattung *Sorbus* begreift nach der Beschreibung (Styli 3, bacca globosa) wohl nur *S. aucuparia*."

Thus, the situation regarding the typification of *Sorbus* was clear and unquestionable until 1908, when Britton, contrary to both the then current usage and Linnaeus's protologue, completely reversed it and created the basis for confusion by his choice of *Sorbus domestica* as the lectotype of *Sorbus*. According to the *International Code* (1966, Guide for the determination of types, p. 72, point 4f), "The first choice of a lectotype must be followed by subsequent workers (Art. 8) unless the original material is rediscovered, or unless it can be shown that the choice was based upon a misinterpretation of the protologue." It is clear that the first formal choice of the lectotype species of *Sorbus*, made by Britton, can not be followed because it was based upon "a misinterpretation of the protologue," i.e., upon disregard of an important part of the original generic description. Thus, as already shown, *Sorbus domestica* disagrees with the statement of the generic description "Styli 3" and with the position of the genus in *Icosandria-Trigynia*. Rehder's choice (Bibliogr. Cult. Trees Shrubs 252. 1949) of *Sorbus aucuparia* as the lectotype of *Sorbus*, although tardy and unexplained by him, turns out to be correct since *S. aucuparia*, with its usually three-carpellate gynoecium with three styles, entirely fits the generic description and the position of the genus in *Icosandria-Trigynia*. The circumstance that Medicus segregated *S. aucuparia* as a distinct genus can not affect the typification, since "If it can be shown that the element best fitting the protologue has been removed, it should be restored and treated as the lectotype" (Int. Code Bot. Nomencl. 72, point 4e).

It is rather unfortunate that the authors of such important reference works as Hutchinson's *Genera of Flowering Plants* (vol. 1, 1964) and Schultze-Motel's *Verzeichnis forstlich kultivierter Pflanzenarten* (Kulturpflanze Beih. 4. 1966), and some recent monographers of the genus, such

as Kovanda (Preslia 33: 1-16. 1961) and Düll (Ber. Bayer. Bot. Ges. 34: 11-65. 1961), have adopted Britton's (and Hitchcock and Green's) choice of *Sorbus domestica* as the lectotype of *Sorbus* without verification. (For the typification of *Melochia* L., another genus for which two lectotypes have been proposed, see Brizicky, Jour. Arnold Arb. 47: 70, 71, footnote 4. 1966.)

I hope that from this rather detailed account of the typification of *Sorbus* it will be evident why I disagree with the opinions expressed by my esteemed colleague, Dr. Stearn, and why I think that it is essential, in the interests of nomenclatural stability, to verify immediately and to establish clearly the typification of *all* generic names, *especially* those for which more than one lectotype species has been chosen.

INTRAGENERIC CLASSIFICATION OF SORBUS

There has been much discrepancy in the citation of the names of the original authors of the subgeneric and sectional names in *Sorbus*, and, consequently, many unnecessary new combinations in these categories have been made. It seems expedient, therefore, to present as an addendum the intrageneric classification of *Sorbus* with the correct authorship of the subgeneric and sectional names. Only the most important synonyms are included.

Sorbus Linnaeus, Sp. Pl. 1: 477. 1753; Gen. Pl. ed. 5. 213. 1754. LECTOTYPE SPECIES: *S. aucuparia* L.; see A. Rehder, Bibliogr. Cult. Trees Shrubs 252. 1949.

SUBGENERA

Subg. **Sorbus** [*Sorbus* subg. *Sorbus* Pers. Synop. Pl. 2: 38. 1806, emend. Duchartre in D'Orbigny, Dict. Univ. Hist. Nat. 11: 685. 1848.] (*Aucuparia* Medic. Gesch. Bot. 86. 1793, *nom. illegit.* *Sorbus* subg. *Aucuparia* Kovanda, Preslia 33: 14. 1961; Düll, Ber. Bayer. Bot. Ges. 34: 23. 1961.)

Subg. **Cormus** (Spach) Duchartre in D'Orbigny, Dict. Univ. Hist. Nat. 11: 685. 1849. (*Cormus* Spach, Hist. Nat. Vég. 2: 96. 1834. *Sorbus* Medic. Gesch. Bot. 87. 1793, non L. Gen. Pl. ed. 5. 213. 1754. *Sorbus* subg. *Sorbus* Kovanda, Preslia 33: 14. 1961; Düll, Ber. Bayer. Bot. Ges. 34: 15. 1961.) TYPE SPECIES: *S. domestica* L.

Subg. **Aria** Persoon, Synop. Pl. 2: 38. 1806. TYPE SPECIES: *S. aria* (L.) Crantz; cf. Int. Code Bot. Nomencl. Art. 22. 1966.

Subg. **Torminaria** (Reichenb.) Koch, Hort. Dendrol. 178. 1853. (*Pyrus* L. subg. *Torminaria* (DC.) Reichenb. Consp. Reg. Veg. 1: 168. 1828.) TYPE SPECIES: *S. torminalis* (L.) Crantz.

Subg. **Chamaespilus** (Reichenb.) Koch, Hort. Dendrol. 176. 1853. (*Pyrus* L. subg. *Chamaespilus* (Lindley) Reichenb. Consp. Reg. Veg. 1: 168. 1828.) TYPE SPECIES: *S. chamaespilus* (L.) Crantz.

SECTIONS

Sect. **Sorbus** [Sect. *Eusorbus* Boiss. Fl. Orient. 2: 657. 1872.]

- Sect. **Cormus** (Spach) Boiss. Fl. Orient. 2: 657. 1872. (*Cormus* Spach, Hist. Nat. Vég. 2: 96. 1834.) TYPE SPECIES: *S. domestica* L.
- Sect. **Aria** (DC.) Dumortier, Florula Belg. 93. 1827. (*Pyrus* L. sect. *Aria* DC. Prodr. 2: 635. 1825.) TYPE SPECIES: *S. aria* (L.) Crantz; cf. Int. Code Bot. Nomencl. Art. 22. 1966.
- Sect. **Torminaria** (DC.) Dumortier, Florula Belg. 93. 1827. (*Pyrus* L. sect. *Torminaria* DC. Prodr. 2: 636. 1825.) TYPE SPECIES: *S. torminalis* (L.) Crantz.
- Sect. **Chamaespilus** (Lindley) Schauers, Uebers. Arbeit. Veränder. Schles. Ges. Vaterl. Kult. 1847: 295. 1848. (*Pyrus* L. sect. *Chamaespilus* Lindley, Trans. Linn. Soc. London 13: 98. 1822.) TYPE SPECIES: *S. chamaespilus* (L.) Crantz.